CLAIMS

1. Method for automatically matching the levels of the signals ~~(IN1, OUT2)~~ exchanged between a first apparatus ~~(3)~~ and a second apparatus ~~(4)~~ which communicates with the said first apparatus ~~(2)~~ via a transmission line ~~(6)~~, characterized in that it comprises the following steps:

- the signal ~~(OUT2)~~ which comes from the transmission line ~~(6)~~ and is received by the first apparatus ~~(2)~~ is digitized,

- on the basis of the digital data representing the signals ~~(IN1, OUT2)~~ exchanged with the transmission line ~~(6)~~, an estimate is made of the transfer function (K) equal to the ratio of the signal ~~(OUT2)~~ received by the first apparatus to the signal (IN1) transmitted by the first apparatus,

- each of the exchanged signals ~~(IN1, OUT2)~~ is respectively multiplied by a suitable gain ~~(G1, G2)~~ determined on the basis of the estimated value of the said transfer function ~~(K)~~.

2. Method according to Claim 1, characterized in that it comprises the following steps:

- the estimate of the transfer function ~~(K)~~ defined in the following way is made:

$$\frac{OUT2}{IN1} = K(Z_L) + \varepsilon$$

where

$$K(Z_L) = \frac{Z_L}{2 \cdot (Z_L + 2 \cdot R_1)}$$

and Z_L represents the impedance of the transmission line ~~(6)~~, while R1 represents the source impedance of the transmission line ~~(6)~~,

- the following are calculated:

for the transmitter signal, the first gain G1

$$G1(Z_L) = \frac{1}{1 - 2 \cdot K(Z_L)}$$

and for the received signal, the second gain ~~G2~~

$$G2(Z_L) = \frac{1}{1 - 2 \cdot K(Z_L)} .$$

3. Method according to Claim 1 ~~or 2,~~ characterized in that the gain ~~(G2)~~ of the signal ~~(OUT2)~~ received by the first apparatus is chosen so that the component of the signal transmitted by the second apparatus ~~(IN2)~~ in the signal ~~(OUT2)~~ received by the first apparatus is independent of the impedance ~~(ZL)~~ of the transmission line.

4. Method according to ~~one of Claims 1 to 3,~~ claim 1 characterized in that the gain ~~(G1)~~ of the signal ~~(IN1)~~ transmitted by the first apparatus is chosen so that the component of this signal ~~(IN1)~~ in the signal ~~(OUT2)~~ received by the second apparatus is independent of the impedance ~~(ZL)~~ of the transmission line.

5. Method according to ~~one of Claims 3,~~ claim 3 characterized in that the said calculation method implements an identification algorithm.

6. Device for automatically matching the levels of signals ~~(IN1, OUT2)~~ exchanged between a first apparatus ~~(3)~~ and a second apparatus (4) communicating via a transmission line ~~(6),~~ characterized in that it has:

- an analogue/digital converter ~~(46)~~ capable of digitizing a signal ~~(OUT2)~~ entering the first apparatus ~~(3),~~

- a digital/analogue converter ~~(40)~~ capable of converting a signal transmitted by the first apparatus,

- a calculation block ~~(10)~~ intended to estimate the ratio of the incoming signal ~~(OUT2)~~ to the signal ~~(IN1)~~ transmitted by the first apparatus, and to determine the gains ~~(G1, G2)~~ needed for matching the levels of the signals transmitted and received by the first apparatus ~~(IN1, OUT2)~~, the said gains being dependent on the said ratio.

7. Device according to Claim 6, characterized in that the block ~~(10)~~ has a unit ~~(12)~~ for identifying the transfer function ~~(K)~~ interacting with a calculation module ~~(14)~~ which is intended to supply a first amplification means ~~(16)~~ with the first gain ~~(G1)~~ for matching the level of the signal ~~(IN1)~~ transmitted by the first apparatus, and to supply a second

amplification means ~~(18)~~ with the second gain ~~(G2)~~ for matching the level of the signal ~~(OUT2)~~ received by the first apparatus.

8. Device according to ~~one~~ claim 5 of Claims 5 to 7, characterized in that the calculation block ~~(10)~~ has a DSP circuit implementing an identification algorithm.

9. Device according to Claim 8, characterized in that the identification algorithm is of the LMS, RLS or Kalman type.

10. Communication apparatus ~~(3)~~, characterized in that it has a device according to ~~one of Claims 6 to 9~~ claim 6.